CLAIMS

1.   A method for generating bump map data substantially in real time for use in a 3-dimensional computer graphics system comprising the steps of:

receiving data defining an area to which a texture is to be applied;

receiving texture data to apply to the area, the data including surface height data;

filtering each of a set of partially overlapping samples of the texture data;

deriving surface tangent vectors from the filtered samples; and

deriving a bump map surface normal from the surface tangent vectors.

2.   A method according to claim 1 in which the tangent vectors are defined in local tangent space.

3.   A method according to claim 1 or 2 in which the filtering step includes the step of using bi-quadratic B-splines to model a height surface from the surface height data.

4.   A method according to claims 1, 2, or 3 in which the filtering step includes the step of using existing hardware in the colour channels of the 3D graphics system to filter the overlapping samples of texture data.

5.   A method according to claim 3 in which the filtering step is modified with blending factors.

6.   Apparatus for generating bump map data substantially in real time for use in a 3-dimensional computer graphics system comprising:

means for receiving data defining an area to which a texture is to be applied;

means for receiving texture data to apply to the area, the data including height data;

means for filtering each of a set of partially overlapping samples of the texture data;

means for deriving surface tangent vectors from the filtered samples; and

means for deriving a bump map surface normal from the surface tangent vectors.

7.   Apparatus according to claim 6 in which the step of tangent vectors are defined in local tangent space.

8.   Apparatus according to claim 6 or 7 in which the filtering means comprises a means to use bi-quadratic B-splines to model height surface from the surface height data.

9.   Apparatus according to claims 6, 7, or 8 in which the filtering means includes means to use existing hardware in the colour channels of the 3D graphics system to filter the overlapping samples of texture data.

10.   Apparatus according to claim 8 in which the filtering modifies the filtering with blending factors.

11. A 3D graphics system comprising a plurality of colour
data processing means for generating data for use in shading
an image to be represented by the 3D graphics system;

means for supplying texture data to be applied to the
image; and

means for assigning the colour data processing means to
the generation of bump map data for use in applying the
texture data to the image.

12. A method for generating bump map data substantially in
real time for use in a 3-dimensional computer graphics
system substantially as herein described.

13. Apparatus for generating bump map data substantially as
herein described with reference to figure 7 of the drawings.

14. A method for generating bump map data for use in a 3-
dimensional computer graphics system comprising the steps
of:

receiving data defining an area to which a texture is
to be applied;

receiving texture data to apply to the area, the data
including surface height data;

filtering each of a set of partially overlapping
samples of the texture data;

deriving surface tangent vectors from the filtered
samples; and

deriving a bump map surface normal from the surface
tangent vectors.

15. Apparatus for generating bump map data for use in a 3-
dimensional computer graphics system comprising:

means for receiving data defining an area to which a texture is to be applied;

means for receiving texture data to apply to the area, the data including height data;

means for filtering each of a set of partially overlapping samples of the texture data;

means for deriving surface tangent vectors from the filtered samples; and

means for deriving a bump map surface normal from the surface tangent vectors.